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REAL-WORLD UTILIZATION PATTERN OF BIOLOGICS IN RHEUMATOID ARTHRITIS: A POPULATION-BASED STUDY

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OBJECTIVES: In November 2011, Center for Drug Evaluation completed the project which aimed to re-evaluate the currently reimbursed biologics for rheumatoid arthritis (RA), and to establish the evidence-based revision rules of reimbursed items covered by National Health Insurance (NHI). As part of the project, this study analyzed the NHI claim data to capture the utilization and prescription pattern of reimbursed biologics in adult patients. **METHODS:** Identity-encrypted claims data, including inpatient, ambulatory care and contracted pharmacies prescriptions, during 2001 to 2010 were utilized. All records with etanercept, adalimumab and rituximab were identified in the first step. Then the records were further separated into RA and non-RA usage, according to the diagnosis codes. Moreover, the RA patients who were newly treated with biologics were enrolled to assess long-term prescription pattern. We performed both Kaplan-Meier analyses to assess biologics switching over time and medication possession rates to evaluate medication compliance. **RESULTS:** The expenditure of biologics for RA patients increased rapidly in the past decade and came to NT\$ 1.37 billion in 2010. Among 5,142 patients treated by biologics in 2010, 88% received etanercept or adalimumab, and 12% received rituximab. In prescription pattern analysis, rituximab was not reported due to lack of long-term data (reimbursed for RA since November 2008). A total of 3,928 and 1,508 patients initiated by etanercept and adalimumab were analyzed, separately. About 34% of etanercept subjects appeared switching over 85 months and 27% of adalimumab subjects applied second biologics over 45 months. The mean durations of continuous prescription were 29 months and 14 months, and the medication possession rates were 78% and 93%, respectively. **CONCLUSIONS:** Under current reimbursement rules, the persistence and compliance of biologic for RA patients were satisfactory. However, the increasing numbers of patients and biological alternatives might intensify the financial pressure on NHI.

PHP21

DOES NATIONAL ESSENTIAL MEDICINE SYSTEM IMPROVE RATIONAL DRUG USE IN PRIMARY HEALTH CARE FACILITIES? AN EMPIRICAL STUDY IN RURAL CHINA

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OBJECTIVES: To examine the effect of National Essential Medicine System (NEMS) on rational drug use (RDU) in primary health care facilities in rural China and to provide reflections and policy implications for currently implemented new health care reform. **METHODS:** Data was obtained from 151 township hospitals in four provinces by means of field survey (stratified random sampling) conducted between 2010–2011. Indicators of RDU were compared before and after NEMS, and discussed in regard to WHO Standard Guidelines or data from other researches. **RESULTS:** Under NEMS, average number of drugs per encounter decreased from 3.64 to 3.46 ($p < 0.01$). Little effect was found in the average number of antibiotics per encounter, but the percentage of encounters with antibiotics prescribed decreased from 60.26% to 58.48% ($p < 0.01$). The percentage of encounters with injection prescribed and the percentage of encounters with hormone prescribed also decreased and the current proportion was 40.31% and 11.16%, respectively. But unfortunately all the above values remained higher than WHO international standards. The percentage of drugs prescribed from National Essential Drug List increased from 63.33% to 79.89% ($p < 0.01$). The average expenses per encounter increased from RMB 25.77 to 26.71 with the available data, but was not significant ($p = 0.362$) and warranted further investigation. **CONCLUSIONS:** The implementation of NEMS has greatly improved rational drug use in primary health care facilities in rural China. But the over-prescription of antibiotics and injections and polypharmacy remain common. Treatment guidelines should be established and closely adhered to. Continuing medical education on RDU for both health workers and the public as well as intensive support supervision are the essential actions taken.

PHP22

OFF-LABEL USE OF INTRAVENOUS NON-STEROIDAL ANTI-INFLAMMATORY DRUGS-KETOROLAC IN A NATIONALLY REPRESENTATIVE POPULATION

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OBJECTIVES: Emerged evidence has linked non-steroidal anti-inflammatory drugs (NSAIDs) to cardiovascular adverse outcomes. Specifically, parenteral NSAIDs such as ketorolac were associated with higher risk of adverse outcomes than oral ones. Recent policy concern has therefore focused on the rational use of parenteral NSAIDs. Using 2000–2009 Taiwan's National Health Insurance research database (NHIRD), the objective of this study was to provide an estimate of off-label use of ketorolac in a nationally representative sample. **METHODS:** Inpatient ($n = 303,733$) and outpatient prescriptions ($n = 605,750$) of parenteral ketorolac from 2000 through 2009 were identified from a random sample of 1,000,000 individuals in NHIRD in 2005. Ketorolac prescribing outside the indications approved by the Taiwan Food and Drug Administration (i.e. short term use (≤ 5 days) for postoperative pain) was defined as off-label use. Differences in patient and prescriber characteristics between licensed and off-label prescriptions were assessed with chi-square tests for categorical variables and t-tests for continuous variables. **RESULTS:** Off-label use of ketorolac was estimated to be 28.5% at the inpatient settings. The off-label use was more frequent at the outpatient settings (90% of the outpatient prescriptions), with the highest proportion of off-label use among pediatric patients (< 6 years old (y/o): 97.2%, 6–18 y/o: 95.8%, 18–65 y/o: 95.1%, and > 65 y/o:

94.7%). Approximately 50% of the outpatient off-label prescriptions of ketorolac came from metropolitan hospitals. Also, the majority of the outpatient off-label prescriptions of ketorolac were prescribed by the emergency departments. **CONCLUSIONS:** Our results suggest that the actual extent of off-label use of ketorolac could be very high, especially at the outpatient settings. It highlights the need for a better understanding of the reasons behind this phenomenon, a more appropriate definition of the role of ketorolac in pain managements, and a more efficient policy intervention to rationalize the use of ketorolac.

PHP23

DOES COMBINATION PHARMACOLOGICAL INTERVENTION FOR SMOKING CESSATION PREVENT POST-CESSATION WEIGHT GAIN?

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OBJECTIVES: A systematic review was conducted to summarize if combination pharmacological therapy for smoking cessation offers an effective way to reduce post-cessation weight gain. **METHODS:** The following databases were researched: Medline, Pubmed, PsycINFO, CENTRAL and EMBASE. Detailed inclusion and exclusion criteria were specified a prior before conducting abstract and full text screening. Included studies were required to: 1) report data on combination pharmacotherapy including at least one FDA-approved smoking cessation medication; 2) report outcome measure of weight change; 3) incorporate a minimum of 2-week follow-up; and 4) recruit adult smokers. Studies were excluded if they had 1) behavioral interventions; 2) sample size of < 30 ; 3) switching medications; or 4) they were not written in English. Abstracts and the full texts were reviewed independently by two investigators. Inclusion of studies was decided by a third independent investigator in case of disagreement between the two primary investigators. **RESULTS:** Out of 1873 citations identified, a total of 1083 citations were included for abstract screening. Finally 13 studies met the eligibility criteria after full text screening of 242 citations. Seven studies showed that participants in the combined therapy group had less post-cessation weight gain than those in the group of individual drugs or placebo. Four studies did not report differential weight gain measures by treatment groups, another study only reported the results of F-tests among treatment groups, and smoking cessation groups without reporting pre-post average weight change. Only one study showed that post-treatment weight gain in the combined therapy group was more than the monotherapy group, although the result was not statistically significant. **CONCLUSIONS:** Seven out of thirteen studies indicated that combination smoking cessation medications had less post-cessation weight gain than monotherapy or placebo in short term. Long term weight gain was not well documented by most of the studies and is subjected to future research.

PHP24

ASSESSMENT OF THE IN EXCESS NHI-COVERED MEDICATIONS OF OUTPATIENTS IN A 2000-BED MEDICAL CENTER IN TAIWAN

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OBJECTIVES: To evaluate the extent of excess NHI-covered medications in China Medical University Hospital (CMUH), as the surrogate indicator of inappropriate prescribing and medication practices. **METHODS:** Those patients who have visited outpatient units in CMUH 3 for 50% of all outpatient visits were assigned as CMUH loyal patients by Bureau of NHI in Taiwan. They have received Integrated Medical Care (IMC) services in CMUH since December 2009. Patients who have visited outpatient units in CMUH, including those in IMC services, were encouraged to recycle their excess prescription medications to the Department of Pharmacy and learn about proper medication use and its disposal during July 2011 to February 2012. Those retrieved prescription medications were classified based upon their clinical applications and checked for their reimbursed cost using information obtained from the Bureau of NHI. The differences during implementation period between IMC service group and usual care (UC) group were compared using Chi-square test and t-tests. **RESULTS:** While 32 patients in IMC group and 15 in the UC group recycled their excess medications, more patients in the IMC group had coronary artery disease ($p = 0.03$). Although IMC group have made more outpatient visits significantly than UC group (29 ± 24 vs. 9 ± 9 , $p = 0.004$), their inpatient visits in CMUH were similar. The average pill counts were 433 ± 119 versus 223 ± 60 ($p = 0.03$) and cost of excess prescription medication were $2,219 \pm 607$ versus $2,126 \pm 950$ NTD in IMC and UC group, respectively. While HTN, DM and hyperlipidemia were the three major diseases in both groups, those agents for cardiovascular disease and DM accounted for 39% and 15% of all estimated cost of excess medication. **CONCLUSIONS:** With the substantial excess, NHI-covered medications for chronic illness among CMUH outpatients, it is necessary to come up with workable strategies to enhance appropriate prescribing and medication use in outpatient units.

PHP25

MARKET ANALYSIS OF ANTIBIOTICS CONSUMPTION IN NORTHERN PART OF IRAN DURING 2001-2010

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OBJECTIVES: Iran's Rational Drug Use Committee (RUD) reported that antibiotics' consumption rate has been arisen in the past decade and they were among the first five most used drugs. Irrational use of antibiotics can cause microbial resistance and move a huge part of the government financial support, this research looks forward to study about the antibiotic consumption's in Northern states which have around 10% of the whole Iran's population and comparing them with Iran's total